



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,946	07/11/2006	Koji Yamashita	1019519-000537	1465

21839 7590 10/07/2008
BUCHANAN, INGERSOLL & ROONEY PC
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER

CHERRY, STEPHEN J

ART UNIT	PAPER NUMBER
----------	--------------

2863

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

10/07/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary	Application No. 10/585,946	Applicant(s) YAMASHITA ET AL.	
	Examiner Stephen J. Cherry	Art Unit 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 1-11 and 24-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-23 and 33-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6-25-2008, 4-4-2008, 1-14-2008, 7-11-2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Claims 1-11, and 24-32 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 7-30-2008. Claims 12-23 and 33-39 have been elected.

Applicant's election with traverse of the restriction in the reply filed on 7-30-2008 is acknowledged. The traversal is on the ground(s) that the inventions are related by a single inventive concept. This is not found persuasive because the argument did not state what the single inventive concept is.

The requirement is still deemed proper and is therefore made FINAL.

Specification

The abstract of the disclosure is objected to because it of over 150 words. Correction is required. See MPEP § 608.01(b).

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 2863

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12-23, 33-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors, for example "the high pressure" at line 7 of claim 12 lacks antecedent basis. Claim 34 recites, "such as the composite variables". Claims 35 and 39 recite, "the arithmetic operation", which lacks antecedent basis. Applicant is encouraged to carefully review the claims for additional errors.

Claims 12, 14-20, 23, 33-34, 36-38 recite a compressor, condenser, expansion unit and evaporator connected via a pipeline, but the specific interconnections are not recited; therefor the connection of the pressure measurement unit an temperature measurement units at areas between components is indefinite.

Claim 13 recites "the arithmetic operation on the correlation", which lacks antecedent basis in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2863

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 12, 14-15, 17, and 33-34 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,658,373 to Rossi et al.

Regarding claim 12, Rossi discloses a refrigerating cycle apparatus characterized by comprising: a refrigerating cycle formed by connecting a compressor, a condenser, expansion unit and an evaporator via a pipeline, and flowing a refrigerant through the inside thereof ('373, fig. 1); a high pressure side measurement unit that is high pressure measurement unit for measuring the high pressure of a refrigerant pressure at any position on a flow passage leading from the discharge side of the compressor to the expansion unit or condensation temperature measurement unit for measuring the saturation temperature at the high pressure ('373, fig. 1, LT and LP); a low pressure side measurement unit that is low pressure measurement unit for measuring the low pressure that is the pressure of refrigerant at any position on the flow passage leading from said the expansion unit to the suction side of the compressor or evaporation temperature measurement means unit for measuring the saturation temperature at said the low pressure ('373, fig. 1, ST and SP); a refrigerant temperature measurement unit that is liquid temperature measurement unit for measuring the temperature at any position on the flow passage leading from the condenser to the expansion unit, discharge temperature measurement unit for measuring the

Art Unit: 2863

temperature at any position on the flow passage leading from the compressor to the condenser, or suction temperature measurement unit for measuring the temperature at any position on the flow passage leading from the evaporator to the compressor ('373, fig. 1, LT and ST); an arithmetic unit for performing the arithmetic operation on the composite variables from the measured values of the high pressure side measurement unit, the low pressure side measurement unit and the refrigerant temperature measurement the ('373, fig. 2, ref. 22); and a judgement unit for judging the abnormality of the refrigerating cycle based on the comparison result by comparing the values stored in the past ('373, table 1) and the current measured values or arithmetic values, as well as storing each of the measured values or the arithmetic values ('373, col. 10, line 62 to col. 14, line 9).

Regarding claim 14, Rossi discloses a refrigerating cycle apparatus according to claim 12 wherein the judgement unit for judging the operating condition of the refrigerating cycle discriminates a refrigerant leakage from the refrigerating cycle, a refrigerant liquid back-flow to said the compressor, a deterioration due to the lifetime of said the compressor, a blemish or rupture on the surface of heat exchange for the condenser or the evaporator ('373, col. 12, line 15-20), a deterioration or failure of a blower unit of the condenser or the evaporator, clogging of a strainer for removing the contaminant inside the pipeline through which the refrigerant is circulated, clogging of a dryer for preventing the humidity of refrigerant, a bend, rupture or clogging of the pipeline, or a deterioration of a refrigerator oil useful for the compressor, or discriminates whether or not any of the abnormalities is involved.

Regarding claim 15, Rossi discloses a refrigerating cycle apparatus according to claim 12, further comprising learning unit having at least one state quantity of a numerical value representing the correlation of making the arithmetic operation on the plurality of measured values, the plurality of arithmetic values from the measured values, or the plurality of measured values or arithmetic values as the plurality of variables, and learning at least the numerical value representing the correlation calculated as the plurality of variables in learning the state quantities of the state where the refrigerating cycle is normally operating ('373, col. 11, line 14 to col. 14, line 9).

Regarding claim 17, Rossi discloses a refrigerating cycle apparatus according to claim 12, wherein the state quantities of the abnormal operation used by the judgement unit for judging the operating condition of the refrigerating cycle are obtained by compulsorily converting any one of said the measured values or said the arithmetic values obtained by making the arithmetic operation on the measured values into another value, the values converted into the another value including the measured value by refrigerant temperature measurement unit that is liquid temperature measurement unit for measuring the temperature at any position on the flow passage leading from the condenser to the expansion means unit, discharge temperature measurement unit for measuring the temperature at any position on the flow passage leading from the compressor to the condenser, or suction temperature measurement unit for measuring the temperature at any position on the flow passage leading from the evaporator to the compressor, or the arithmetic value obtained by making the arithmetic

Art Unit: 2863

operation on the measured value ('373, fig. 4, electrical values of voltage or current at ref. 216 and 218 are converted to values within microprocessor).

Regarding claim 33, Rossi discloses a refrigerating cycle monitoring system comprising a remote monitoring apparatus for monitoring the operating condition of a refrigerating cycle apparatus, wherein at least one of the measurement values measured by the refrigerating cycle apparatus, the arithmetic values obtained by arithmetic operation, and the judgement result as to whether or not the refrigerating cycle apparatus is in the normal operating condition by comparing said the arithmetic values are within a set threshold is transmitted via a communication line ('373 fig. 4 depicts communication lines which transmit values in table 1) or the radio communication, the refrigerating cycle apparatus comprising: a refrigerating cycle formed by connecting a compressor, a condenser, expansion unit and an evaporator via a pipeline, and flowing a refrigerant through the inside thereof ('373, fig. 1); a high pressure side measurement unit that is high pressure measurement unit for measuring the high pressure of a refrigerant pressure at any position on a flow passage leading from the discharge side of the compressor to the expansion unit or condensation temperature measurement unit for measuring the saturation temperature at the high pressure ('373, fig. 1, LT and LP); a low pressure side measurement unit that is low pressure measurement unit for measuring the low pressure that is the pressure of refrigerant at any position on the flow passage leading from the expansion unit to the suction side of the compressor or evaporation temperature measurement unit for measuring the saturation temperature at the low pressure ('373, fig. 1, ST and SP); a

Art Unit: 2863

refrigerant temperature measurement unit that is liquid temperature measurement unit for measuring the temperature at any position on the flow passage leading from the condenser to the expansion unit, discharge temperature measurement unit for measuring the temperature at any position on the flow passage leading from the compressor to the condenser, or suction temperature measurement unit for measuring the temperature at any position on the flow passage leading from the evaporator to the compressor ('373, fig. 1, LT and ST); an arithmetic unit for performing the arithmetic operation on the composite variables from the measured values of the high pressure side measurement unit, the low pressure side measurement unit and the refrigerant temperature measurement unit ('373, fig. 2, ref. 22); and a judgement unit for judging the abnormality of the refrigerating cycle based on the comparison result by comparing the values stored in the past and the current measured values or arithmetic values, as well as storing each of the measured values or the arithmetic values ('373, col. 10, line 62 to col. 14, line 9).

Regarding claim 34, Rossi discloses a refrigerating cycle monitoring system comprising: a high pressure side measurement unit that is high pressure measurement unit for measuring the high pressure of a refrigerant pressure at any position on a flow passage leading from the discharge side of a compressor to expansion unit in a refrigerating cycle apparatus that constitutes a refrigerating cycle by connecting the compressor, a condenser, the expansion unit and an evaporator via a pipeline and flowing a refrigerant through the inside thereof or condensation temperature measurement unit for measuring the saturation temperature at the high pressure ('373,

Art Unit: 2863

fig. 1, LT and LP); a low pressure side measurement unit that is low pressure measurement unit for measuring the low pressure that is a pressure of refrigerant at any position on the flow passage leading from said the expansion unit to the suction side of the compressor or evaporation temperature measurement unit for measuring the saturation temperature at the low pressure ('373, fig. 1, ST and SP); a refrigerant temperature measurement unit that is liquid temperature measurement unit for measuring the temperature at any position on the flow passage leading from the condenser to said the expansion unit, discharge temperature measurement unit for measuring the temperature at any position on the flow passage leading from the compressor to the condenser, or suction temperature measurement unit for measuring the temperature at any position on the flow passage leading from the evaporator to the compressor ('373, fig. 1, LT and ST); an arithmetic unit for acquiring the composite variables from the measured values of the high pressure side measurement unit, the low pressure side measurement unit and the refrigerant temperature measurement unit ('373, fig. 2, ref. 22); a storage unit for storing the measured value of the each measurement unit and the arithmetic values such as the composite variables by making the arithmetic operation on the measured values ('373, fig. 4, ref. 214); a judgement unit for judging the abnormality of the refrigerating cycle based on the comparison result by comparing the values stored in the past by the storage unit and the current measured values or arithmetic values ('373, col. 10, line 62 to col. 14, line 9); and a transmission unit, formed by wire or radio, for transmitting the measured values or the arithmetic values or the judgement result of the judgement unit to a remote monitoring apparatus

Art Unit: 2863

provided at a site away from the refrigerating cycle apparatus ('373, fig. 2 depicts test device 20 remote from ref. 40 and 46).

Allowable Subject Matter

Claims 13, 16, 18-23 and 35-39 are rejected, as described above, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 13 recites, "a comparison unit for comparing the distances between the current operating state quantities including at least the state quantity obtained by making the arithmetic operation on the correlation between the plurality of measured values in the current operating condition of the refrigerating cycle as the plurality of variables and the plurality of state quantities stored in the normal state quantity storage unit or the plurality of state quantities stored in the abnormal state quantity unit; and a judgement unit for judging a degree of normality, a degree of abnormality or a cause of abnormality of the refrigerating cycle from the distances compared by the comparison unit or a change in the distance". This feature, combined with additional claimed subject matter, overcomes the prior art of record.

Claim 16 recites, "wherein the judgement unit for judging the operating condition of the refrigerating cycle acquires a threshold for distinguishing between the normal operating condition and the abnormal operating condition by having the measured

Art Unit: 2863

values or the arithmetic values such as a mean value obtained by the arithmetic operation on said the measured values, compulsorily converting at least one of the measured values or the arithmetic values into another value, and making the arithmetic operation on a plurality of variables including the value after conversion". This feature, combined with additional claimed subject matter, overcomes the prior art of record.

Claim 18 recites, "wherein judging the degree of abnormality of the refrigerating cycle from the value obtained by making the arithmetic operation on an aggregate in which the plurality of variables are combined and associated with each other, and calculating the arithmetic operation result, and predicting a critical time at which the refrigerating cycle can not continue a stable operation". This feature, combined with additional claimed subject matter, overcomes the prior art of record.

Claim 19 recites, "wherein in comparing the distances between the current operating state quantities including at least the state quantity of correlation of making the arithmetic operation on the plurality of measured values from the current operating condition of the refrigerating cycle as the plurality of variables, and the plurality of normal state quantities stored or the plurality of abnormal state quantities stored, a comparison is made between a refrigerant leakage amount that is the operated state quantity in the current operation or its equivalent arithmetic value and a preset refrigerant amount within the refrigerating cycle, a permissible refrigerant leakage amount or its equivalent state quantity, to predict the time to lead to a critical refrigerant amount capable of keeping the cooling power of the refrigerating cycle from the

Art Unit: 2863

comparison result". This feature, combined with additional claimed subject matter, overcomes the prior art of record.

Claim 20 recites, "a judgement unit for judging the abnormality of the refrigerating cycle including a refrigerant leakage by storing the measured values of said the each measurement unit or the arithmetic values calculated from the measured values, and comparing the stored values and the current measured values or arithmetic values; and

an output unit for outputting the refrigerant leakage information in preference to other abnormalities of the refrigerating cycle, when the refrigerant leakage is judged". This feature, combined with additional claimed subject matter, overcomes the prior art of record.

Claim 23 recites, "wherein the arithmetic value from the measured values, the numerical value representing the correlation as the plurality of variables, the value obtained by making the arithmetic operation on an aggregate in which the plurality of variables are combined and associated with each other and calculating the arithmetic operation result, or the distance is the Mahalanobis distance or the numerical value calculated from the Mahalanobis distance". This feature, combined with additional claimed subject matter, overcomes the prior art of record.

Claim 35 recites, "a comparison unit for comparing the distances between the state quantities obtained from the current operating condition of the refrigerating cycle and the state quantities stored in the normal state storage means unit or the plurality of state quantities stored in the abnormal state storage means unit ; and a judgement unit for judging the degree of normality, the degree of abnormality or the cause of

Art Unit: 2863

abnormality in the refrigerating cycle from the distances compared by the comparison unit or a change in the distance". This feature, combined with additional claimed subject matter, overcomes the prior art of record.

Claim 36 recites, "wherein the information as to the presumed time taken until a failure of the equipment occurs based on the arithmetic values measured and calculated at the normal operating time and the operating time elapsed of the refrigerating cycle, the arithmetic values being measured and calculated in the current operating condition, is transmitted and displayed to a remote monitoring apparatus via the transmission unit". This feature, combined with additional claimed subject matter, overcomes the prior art of record.

Claim 37 recites, "storage unit for learning and storing the arithmetic operation result of the arithmetic unit as an abnormal operating state in a condition where the refrigerating cycle is abnormally operating such as a refrigerant leakage, and a plurality of thresholds set halfway in the distance between arithmetic operation results of the normal state and the abnormal state that are stored, wherein the distance between the arithmetic operation result of the current operating condition and the threshold or a temporal change in the distance is displayed in said the remote monitoring apparatus". This feature, combined with additional claimed subject matter, overcomes the prior art of record.

Claim 38 recites, "further comprising output unit for setting the refrigerant amount or refrigerant leakage amount within the refrigerating cycle as the arithmetic value equivalent to each amount and outputting the abnormality of the refrigerating

Art Unit: 2863

cycle as an electric signal or communicating it as a communication code, wherein if a refrigerant leakage, if detected, is outputted to the remote monitoring apparatus prior to other judgement results of the judgement unit". This feature, combined with additional claimed subject matter, overcomes the prior art of record.

Claim 39 recites, "refrigerant leakage foreseeing unit for foreseeing the time when said the refrigerant leaks out of said the refrigerating cycle by comparing the distances between the arithmetic operation result of making the arithmetic operation on the correlation between the physical quantities of the refrigerant in the current operating condition and at least one of the normal operating condition and the abnormal operating condition that are stored, wherein the foreseen result of the refrigerant leakage foreseeing unit is transmitted to a remote monitoring apparatus". This feature, combined with additional claimed subject matter, overcomes the prior art of record.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Cherry whose telephone number is (571) 272-2272. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2863

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael P. Nghiem/
Primary Examiner, GAU 2863

SJC